LISTING OF THE CLAIMS:

1. (Previously Presented) A method for asynchronously transmitting one or more incremental database updates from a primary site to a remote site, the primary site and the remote site interconnected by at least one communication link, the method comprising:

(a) destaging modified data to a first volume at the primary site for a current database update and updating one or more bits in a first bitmap at the primary site that indicate one or more tracks on the first volume that are to be overwritten with the modified data, said updating one or more bits being a first point in time virtual copy of the modified data of the first volume to a second volume, wherein the first point in time virtual copy updates the first bitmap without copying the modified data to the second volume;

(b) transferring the first bitmap to a second bitmap at the primary site for indicating the modified data that is to be transmitted to a third volume, which is at the remote site, for the current database update, the transferring including at least inverting bits of the first bitmap to the second bitmap;

(c) synchronizing the second volume with the third volume for the current database update by transmitting the modified data from either the first volume or the second volume depending on bit setting in the first bitmap, to the third volume as indicated by the one or more bits in the second bitmap; and

(d) performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site.

2. (Previously presented) The method of Claim 1, wherein the first bitmap represents a FlashCopy bitmap and the second bitmap represents a peer-to-peer remote copy (PPRC) bitmap.

3. (Previously presented) The method of Claim 1, wherein the first point in time virtual copy is achieved by flashcopying the modified data of the first volume to the second volume.

4. (Previously presented) The method of Claim 3, wherein the flashcopying initializes the one or more bits in the first bitmap.

5. (Previously presented) The method of Claim 1, wherein the second point in time virtual copy is achieved by flashcopying the modified data of the third volume to the fourth volume.

6. (Previously presented) The method of Claim 1, further comprising providing an application host that is associated with the first volume for performing the one or more incremental database updates.

7. (Previously presented) The method of Claim 1, further comprising staggering the one or more incremental database updates during the current database update.

8. (Previously presented) The method of Claim 7, wherein the staggering comprises:

determining whether a synchronization for a previous database update is complete after the destaging is performed for the current database update; and

waiting for the synchronization of the previous database update to complete before the performing the first point in time virtual copy for the current database update.

9. (Previously presented) The method of claim 8, wherein the staggering further comprises:

initializing the first bitmap for a next database update after the performing the first point in time virtual copy for the current database update; and

waiting for the next database update after the synchronizing for the current database update.

10. (Previously presented) The method of Claim 1, wherein the synchronizing is achieved by establishing a peer to peer remote copy session between the second volume and the third volume for physically transmitting the modified data of the second volume over the at least one communication link to the third volume.

11. (Previously presented) The method of Claim 1, further comprising providing a controller at the primary site for managing access to both the first volume and the second volume; and

providing a controller at the remote site for managing access to the third volume and the fourth volume.

12. (Canceled)

13. (Previously presented) The method of Claim 1, further comprising:

initializing the first bitmap to indicate that all data on the first volume is to be copied to the second volume, and all data that is copied to the second volume is to be copied to the third volume.

14. (Previously presented) The method of Claim 1, further comprising providing a recovery host that is associated with the fourth volume for recovering from a failure of the primary site by providing access to the fourth volume.

15. (Previously presented) The method of Claim 1, further comprising automatically initiating the incremental database updates.

16. (Previously presented) The method of Claim 1, wherein the destaging further comprises:

inspecting the one or more bits of the first bitmap at the primary site to determine whether the second volume includes data of the one or more tracks on the first volume that are to be overwritten with the modified data; and

performing a point in time virtual copy, from the first volume to the second volume, of the data of the one or more tracks on the first volume that are to be overwritten with the modified data if the first bitmap indicates that the second volume does not include the data of the one or more tracks on the first volume that are to be overwritten with the modified data.

17. (Previously presented) The method of Claim 1, wherein the at least one communication link comprises at least one of a channel link; a T1/T3 link; a Fibre channel; and an ESCON link.

18. (Previously Presented) A system for asynchronously transmitting one or more incremental database updates from a primary site to a remote site, the primary site and the remote site interconnected by at least one communication link, the system comprising:

means for destaging modified data to a first volume at the primary site for a current database update and updating one or more bits in a first bitmap at the primary site that indicate one or more tracks on the first volume that are to be overwritten with the modified data, said updating one or more bits being a first point in time virtual copy of the modified data of the first volume to a second volume, wherein the first point in time virtual copy updates the first bitmap without copying the modified data to the second volume;

first means for transferring the first bitmap to a second bitmap at the primary site for indicating the modified data that is to be transmitted to a third volume, which is at the remote site, for the current database update;

means for synchronizing the second volume with the third volume for the current database update by transmitting the modified data from either the first volume or the second volume depending on bit setting in the first bitmap, to the third volume as indicated by the one or more bits in the second bitmap; and

second means for performing a point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site.

19. (Previously presented) The system of Claim 18, wherein the first bitmap represents a FlashCopy bitmap and the second bitmap represents a peer-to-peer remote copy (PPRC) bitmap.

20. (Previously presented) The system of Claim 18, wherein the first means performs a flashcopying of the modified data of the first volume to the second volume.

21. (Previously presented) The system of Claim 20, wherein the flashcopying initializes the one or more bits in the first bitmap.

22. (Previously presented) The system of Claim 18, wherein the second means performs a flashcopying of the modified data of the third volume to the fourth volume.

23. (Previously presented) The system of Claim 18, further comprising an application host that is associated with the first volume for performing the one or more incremental database updates.

24. (Previously presented) The system of Claim 18, further comprising means for staggering the one or more incremental database updates during the current database update.

25. (Previously presented) The system of Claim 24, wherein the means for staggering determines whether a synchronization for a previous database update is complete, after the destaging is performed for the current database update, and waits for the synchronization of the previous database update to complete before the transferring of the first bitmap to the second bitmap for the current database update.

26. (Previously presented) The system of claim 25, wherein the means for staggering initializes the first bitmap for a next database update after the first means performs the point in time virtual copy for the current database update, and waits for the next database update after the means for synchronizing synchronizes the second volume with the third volume for the current database update.

27. (Previously presented) The system of Claim 18, wherein the means for synchronizing establishes a peer to peer remote copy session between the second volume and the third volume for physically transmitting the modified data of the second volume over the at least one communication link to the third volume.

28. (Previously presented) The system of Claim 18, further comprising means for managing access to both the first volume and the second volume; and

means for managing access to the third volume and the fourth volume.

29. (Canceled)

30. (Previously presented) The system of Claim 18, further comprising:

means for initializing the first bitmap to indicate that all data of the first volume is to be copied to the second volume, and all data that is copied to the second volume is to be copied to the third volume.

31. (Previously presented) The system of Claim 18, further comprising a recovery host that is associated with the fourth volume for recovering from a failure of the primary site by providing access to the fourth volume.

32. (Previously presented) The system of Claim 18, further comprising means for automatically initiating the incremental database updates.

33. (Previously presented) The system of Claim 18, wherein the means for destaging further compromises:

means for inspecting the one or more bits of the first bitmap at the primary site to determine whether the second volume includes data of the one or more tracks on the first volume that are to be overwritten with the modified data; and

means for performing a point in time virtual copy, from the first volume to the second volume, of the data of the one or more tracks on the first volume that are to be overwritten with the modified data if the first bitmap indicates that the second volume does not include the data of the one or more tracks on the first volume that are to be overwritten with the modified data.

34. (Previously presented) The system of Claim 18, wherein the at least one communication link comprises at least one of a channel link; a T1/T3 link; a Fibre channel; and an ESCON link.

35. (Canceled)

36. (Previously Presented) A program storage device, tangibly embodying a program of instructions executable by a machine to perform a method for asynchronously transmitting one or more incremental database updates from a primary site to a remote site, the primary site and the remote site interconnected by at least one communication link, the method comprising:

(a) destaging modified data to a first volume at the primary site for a current database update and updating one or more bits in a first bitmap at the primary site that indicate one or more tracks on the first volume that are to be overwritten with the modified data, said updating one or more bits being a first point in time virtual copy of the modified data of the first volume to a second volume, wherein the first point in time virtual copy updates the first bitmap without copying the modified data to the second volume;

(b) transferring the first bitmap to a second bitmap at the primary site for indicating the modified data that is to be transmitted to a third volume, which is at the remote site, for the current database update;

(c) synchronizing the second volume with the third volume for the current database update by transmitting the modified data from either the first volume or the second volume depending on bit setting in the first bitmap, to the third volume as indicated by the one or more bits in the second bitmap; and

(d) performing a second point in time virtual copy of the modified data of the third volume to a fourth volume, which is at the remote site.

37. (Previously presented) The program storage device of Claim 36, wherein the first bitmap represents a FlashCopy bitmap and the second bitmap represents a peer-to-peer remote copy (PPRC) bitmap.

38. (Previously presented) The program storage device of Claim 36, wherein the first point in time virtual copy is achieved by flashcopying the modified data of the first volume to the second volume.

39. (Previously presented) The program storage device of Claim 38, wherein the flashcopying initializes the one or more bits in the first bitmap.

40. (Previously presented) The program storage device of Claim 36, wherein the second point in time virtual copy is achieved by flashcopying the modified data of the third volume to the fourth volume.

41. (Previously presented) The program storage device of Claim 36, wherein the method further comprises providing an application host that is associated with the first volume for performing the one or more incremental database updates.

42. (Previously presented) The program storage device of Claim 36, further comprising staggering the one or more incremental database updates during the current database update.

43. (Previously presented) The program storage device of Claim 42, wherein the staggering comprises:

determining whether a synchronization for a previous database update is complete after the destaging is performed for the current database update; and

waiting for the synchronization of the previous database update to complete before the performing the first point in time virtual copy for the current database update.

44. (Previously presented) The program storage device of Claim 43, wherein the staggering further comprises:

initializing the first bitmap for a next database update after the performing the first point in time virtual copy for the current database update; and

waiting for the next database update after the synchronizing for the current database update.

45. (Previously presented) The program storage device of Claim 36, wherein the synchronizing is achieved by establishing a peer to peer remote copy session between the second volume and the third volume for physically transmitting the modified data of the second volume over the at least one communication link to the third volume.

46. (Previously presented) The program storage device of Claim 36, wherein the method further comprises providing a controller at the primary site for managing access to both the first volume and the second volume; and

providing a controller at the remote site for managing access to the third volume and the fourth volume.

47. (Cancelled)

48. (Previously presented) The program storage device of Claim 36, wherein the method further comprises:

initializing the first bitmap to indicate that all data of the first volume is to be copied to the second volume, and all data that is copied to the second volume is to be copied to the third volume .

49. (Previously presented) The program storage device of Claim 36, wherein the method further comprises providing a recovery host that is associated with the fourth volume for recovering from a failure of the primary site by providing access to the fourth volume.

50. (Previously presented) The program storage device of Claim 36, wherein the method further comprises automatically initiating the incremental database updates.

51. (Previously presented) The program storage device of Claim 36, wherein the destaging further comprises:

inspecting the one or more bits of the first bitmap at the primary site to determine whether the second volume includes data of the one or more tracks on the first volume that are to be overwritten with the modified data; and

performing a point in time virtual copy, from the first volume to the second volume, of the data of the one or more tracks on the first volume that are to be overwritten with the modified data if the first bitmap indicates that the second volume does not include the data of the one or more tracks on the first volume that are to be overwritten with the modified data.

52. (Previously presented) The program storage device of Claim 36, wherein the at least one communication link comprises at least one of a channel link; a T1/T3 link; a Fibre channel; and an ESCON link.

53. (Previously presented) The method of claim 1, wherein during the synchronizing, the first volume is accessible to a host at the primary site, and the fourth volume is accessible to a host at the remote site.

54. (Previously presented) The system of claim 18, wherein during the synchronizing, the first volume is accessible to a host at the primary site, and the fourth volume is accessible to a host at the remote site.

55. (Previously presented) The program storage device of claim 36, wherein during the synchronizing, the first volume is accessible to a host at the primary site, and the fourth volume is accessible to a host at the remote site.

56. (Previously Presneted) A method for backing up data from a primary site to a remote site, comprising:

(a) destaging modified data to a first volume at the primary site for a current database update;

(b) performing a first point in time virtual copy of the modified data of the first volume to a second volume at the primary site by setting a first bitmap without copying the modified data to the second volume;

(c) synchronizing the second volume with a third volume at the remote site by transmitting the modified data from either the first volume or the second volume depending on bit setting in the first bitmap, to the third volume; and

(d) after completion of the synchronizing, performing a second point in time virtual copy of the modified data of the third volume to a fourth volume at the remote site;

wherein, during the synchronizing, the first volume is accessible to a host at the primary site, and the fourth volume is accessible to a host at the remote site.

57. (Previously Presented) The method of claim 1, wherein the step of performing includes performing a first point in time virtual copy of the modified data of the first volume to a second volume at the primary site by updating the first bitmap and transferring the first bitmap to a second

bitmap at the primary site for indicating the modified data that is to be transmitted to a third volume, which is at the remote site, for the current database update; and

the step of synchronizing includes synchronizing the second volume with the third volume for the current database update by determining from the first bit map whether the modified data of the second volume to be transmitted is located in the first volume or the second volume and transmitting the modified data of the second volume to the third volume as indicated by the one or more bits in the second bitmap.

58. (Previously Presented) The method of claim 56, wherein the synchronizing step further includes inspecting the first bitmap to determine whether the modified data is on the first volume or the second volume.